REMARKS

Favorable reconsideration and allowance of the claims of the present application are respectfully requested.

Applicants observe that in the present Office Action the Examiner has indicated that should Claim 1 be found allowable, Claims 7, 8, and 18 would be objected to under 37 C.F.R. §1.75 as being a substantial duplicate thereof.

In order to avoid such an objection, applicants have amended Claims 7 and 8 to limit those claims to multiple ion implantations. In order to avoid future confusion with the terminology "room temperature oxygen ion implantation step", applicants have amended Claims 1, 24, 25, 26 and 27 to positively recite that step (a) is a first oxygen ion implantation and step (b) is a second oxygen ion implantation. In accordance with the present invention, the first oxygen ion implantation creates a damaged implant region, while the second creates an amorphized region adjacent to said damaged implant region. The term "first oxygen ion implantation" replaces the previous recited "base oxygen ion implantation step" and the term "second oxygen ion implantation" replaces the previously recited "room temperature oxygen ion implantation step".

The above amendments to Claim 1 necessitated amendments having to be made to Claims 7 and 8 as well.

Applicants have also amended Claims 1, 25, 26 and 27 to positively recite that the pre-soaking anneal dissolves non-stoichiometric SiO_x precipitates formed during steps (a) and (b). Support for this amendment to the claims is found at Page 13, lines 10-20

Since the above amendments to the claims do not introduce new matter into the originally filed specification, entry thereof is respectfully requested.

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Claims 1-27 stand rejected under 35 U.S.C. § 103 as allegedly unpatentable over the disclosure of U.S. Patent No. 5,930,643 to Sadana et al. ("Sadana")

Applicants respectfully submit that claimed methods recited in independent Claims 1, 24, 25, 26 and 27 are patentably distinguishable over Sadana since the claims of the present application recite the optimal conditions that are necessary to achieve a buried oxide that has a breakdown field of greater than 5 MV/cm. In accordance with the present claimed methods, such a buried oxide (BOX) having the claimed breakdown field is achieved by utilizing a process in which at least one of the following conditions is meant: (i) a first oxygen ion implantation is performed using an oxygen ion dose of about 2.5E17 cm^{-2} or less, (ii) a second oxygen ion implantation is performed at an energy that is about 5 to about 20 % less than an energy used during the first oxygen ion implantation, and/or (iii) a pre-annealing soak cycle is employed prior to an internal oxidation step which dissolves non-stoichiometric SiO_x precipitates formed during previous oxygen ion implantation steps.

Applicants submit that Sadana discloses wide ranges for the first and second oxygen ion implantation steps and fails to recognize the criticality of performing the oxygen ion implantations within the claimed ranges. For example, Sadana discloses that the first oxygen ion implantation can be performed using an oxygen ion dose from about $5x10^{16}$ to about $6x10^{17}$ cm^{-2}. There is no teaching or suggestion in Sadana that a BOX having an improved breakdown field can be obtained if the oxygen dosage of the first oxygen ion implantation is performed at an oxygen dose of 2.5E17 cm^{-2} or less.

Likewise, Sadana does not teach or suggest that a BOX having an improved breakdown field can be obtained if the energy of the second oxygen ion implantation step was at a range that was from about 5 to about 20% below the energy of the first oxygen ion implantation. Applicants

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observe that in Sadana it is mentioned that the first and second implantation can be performed at the same or different energies without specifically reciting that the breakdown field of a BOX can be improved by employing a second oxygen ion implantation at an energy of 5 to about 20% less than the energy used in the first oxygen ion implantation step. Furthermore, in the examples of Sadana the first and second oxygen ion implantation steps are performed at the same energies.

Applicants further submit that Sadana also does not teach or suggest a pre-anneal soak cycle that is capable of dissolving non-stoichiometric SiO_x precipitates formed during the first and second oxygen ion implantation steps. In Sadana, the soaking cycle is performed at 1000°C in 100% O_2. Applicants respectfully submit that the conditions of the prior art soaking cycle disclosed in Sadana is incapable of sufficiently dissolving non-stoichiometric SiO_x precipitates formed during previous performed oxygen ion implantation steps.

In summary, the methods of the claimed invention provide the critical conditions that are necessary to achieve a BOX having an improved breakdown field. Sadana, although disclosing wide ranges for the first oxygen ion implantation, the second oxygen ion implantation and the oxidation step, do not disclose the critical conditions that are required to obtain a BOX having the claimed breakdown field.

Based upon the above remarks, the rejection under 35 U.S.C. § 103 citing Sadana has been obviated. Reconsideration and withdrawal of the obviousness rejection are thus respectfully requested.

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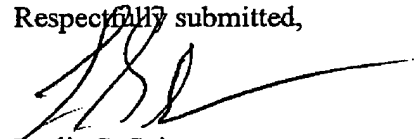
In view of the foregoing amendments and remarks, it is firmly believed that the present case is in condition for allowance, which action is earnestly solicited.

Respectfully submitted,



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